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ABSTRACT

The new school plants contain a great variety of materials and equipment that require a generally higher level of custodial competence. This manual was prepared as a reference guide primarily for custodians. The significant tenets of proper cleaning, cleaning materials, and suggested time schedules form important aspects of the document. (Author)

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SCHOOL HOUSEKEEPING
A Guide for the Modern Custodian

by
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The University of Tennessee

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INTRODUCTION

This guide was prepared to assist school board members, superintendents, principals, teachers, custodians, and other personnel charged with the responsibility of keeping school facilities clean and safe for students. The need for this manual is compounded because of the increasing importance being placed upon the modern school custodian.

The physical environment of the school has a direct effect on the behavior and learning responses of students. Cleanliness is a vital part of this environment; therefore, the importance of this guide is indispensable if proper care and cleaning procedures of school facilities are to be assured.

This manual was prepared as a reference guide primarily for custodians. It also attempts to serve as a means to acquaint the school administration with the various responsibilities of the modern custodian. In bold outline, it presents essential information needed by school personnel in regards to proper cleaning and maintenance procedures. The physical composition of school buildings is made up virtually of every type building material,

which makes proper cleanliness extremely complicated. Significant tenets of proper cleaning, cleaning materials, and suggested time schedules are stressed in this guide. Additional information is included on the treatment of materials and equipment, safety, and the proper care of special facilities, ranging from the care of carpet to the total plant itself.

It is hoped that this guide may be of assistance to the many progressive schools which are becoming fully cognizant of the importance that an immaculate facility has on the implementation of a successful educational program.

PREFACE

This book is a welcome addition to the few existing publications intended to be directly useful to the custodial staff of a school plant. Only in recent years have educators realized the great impact that building custodians have on the morale of staff and students. Proper attention to the maintenance of such factors as safety, cleanliness, climate control, and aesthetic appearance are in evidence in any good teaching-learning situation: and where they are in evidence there is always a quality custodial staff.

The great advances in school planning now in progress have resulted in innovative, functional school plants which use a great variety of materials and equipment. These changes demand an equally great variety in the kinds of custodial practices, and a generally higher level of custodial competence. Educators are now faced with a new set of problems regarding custodial care such as: a program of continuing re-education for the custodian, diversification in duties and developing a custodial staff team concept, and securing adequate materials, supplies and equipment specifically designed to meet new custodial needs.

Supply companies have been quick to respond to new requirements, thus providing administrators an opportunity to make wise choices in providing for the needs of their custodial staff.

This manual reflects the combined wisdom of many years of experience. Each of the contributors is an experienced teacher or administrator with considerable experience in school planning and in the effective use and maintenance of school plants. Their combined experience permits them to view custodial problems from such positions as teacher, principal, superintendent, school plant director, and college business manager. All have worked together as research associates in the University of Tennessee School Planning Laboratory.

The manual is direct in its approach to the problems of school building custodial care and management. Revision of such a manual is inevitable since new materials and equipment will become obsolescent with accelerating advances in school plant planning. In the meantime, this manual should be a must in every school and school system. Its proper use should result in enhancing the functional and aesthetic qualities of the educational environment and in the custodial staff receiving justly deserved recognition and respect.

Orin B. Graff

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CHAPTER I

SELECTION, TRAINING, AND GENERAL RESPONSIBILITIES OF THE CUSTODIAN

The custodian is enmeshed in a rapidly changing occupation due to new materials, methods, and demands being forced upon him by a dynamic educational scene. The fact that larger sums of money are now being expended on school plant construction, and that these buildings are greater in size, value and complexity make it necessary for a corresponding improvement in the caliber of men serving as custodians. It is the purpose of this chapter to enumerate some general attributes and responsibilities, as well as some guidelines in selecting the "modern" custodian.

Custodians are responsible to the principal. Systems large enough to justify the establishment of adequate supervision from the central office over custodial services have an advantage in that such supervision will usually establish better methods and standards of work and check on adequate performance. In most systems, however, the principal, as head of the school, is directly responsible for the total operation and success of his

institution. The custodian in these cases often becomes the principal's right hand man. This type of principal usually recognizes how important the custodial role is and appreciates the fact that a clean, well kept, and properly heated and ventilated building influences favorably the teaching and learning process. The custodian in return respects the wishes of the principal and carries out his suggestions and requests, and assists in every way possible to assure a clean and well-organized building.

The relationship should be friendly, courteous and obliging. Part of the custodian's responsibility is to serve teachers and pupils. He must also treat these people with courtesy and respect; with a sense of friendliness being maintained in a dignified, professional manner. From time to time, teachers and pupils will ask the custodian to do a special task in connection with their school work. The custodian should strive to assist them in a cheerful and pleasant manner without lamentation, and without attempting to excuse himself from such additional duties. Although a teacher or a principal may occasionally appear caustic, the custodian should attempt to overlook this. Teachers occasionally become nervous and irritable when working with 30

active, peppy and sometimes mischievous children. At a time like this, a pleasant obliging attitude on the part of the custodian may help to cheer her up.

There will be times when a custodian must enter a classroom during recitation and study periods. He must do so quickly and quietly and perform whatever task necessary with as little disturbance as possible.

Since it is part of the custodian's job to serve teachers, there will be times when he must alter his routine and go out of his way to see that they are accommodated. For instance, if a teacher keeps pupils in after school for a special reason, the custodian should avoid going into the room at that time to do his routine cleaning. There may be other times when a teacher is working alone in her room after school and would not want to be disturbed. Even though his work is extremely important, in most cases it is up to the custodian to accommodate the teacher, rather than the teacher accommodate the custodian. As a general rule, however, the teacher will usually cooperate with the custodian and not interfere with the performance of his duties. Should a teacher try to monopolize a custodian's time, it is up to the principal, not the custodian, to tactfully correct the situation.

Relationships with pupils should be friendly and pleasant but should not destroy the adult-child relationship. By being friendly and earning the respect of the pupils, the custodian will find them cooperating with him in his work. It must be remembered that it is the responsibility of the teacher to correct or give direction to pupils and not the custodian.

The custodian is a part of the public relations program. There will be many occasions when it is necessary for the school to be open after regular school hours for school or community events. An obliging, helpful and friendly attitude on the part of the custodian will do much to establish rapport between the school and community.

School Custodian. Normally, the custodian is entrusted with the community's largest single investment. But the responsibility doesn't stop with the care of the school building; it includes the safety, health, and comfort of all persons who utilize the building. A good custodian is not just a person who cleans the building; he is all of the above and more. A custodian who is fully meeting his responsibility is a man of many talents; but his importance is probably

underestimated more by the custodian himself than by others. The good custodian must believe in himself and in the job he is doing. If he has a personality that attracts the respect and appreciation of his fellow workers and students, he will usually find they are more likely to cooperate with him in carrying out his duties.

CHARACTERISTICS OF A GOOD CUSTODIAN

1. A custodian believes in himself and in the importance of his job.
2. The custodian is dependable and punctual.
3. The custodian is loyal to his school and his fellow workers.
4. The custodian is fair, friendly, and impartial in his dealings with others.
5. The custodian is courteous and pleasant.
6. The custodian has few, if any, objectionable traits.
7. The custodian is a peaceful and loyal citizen in the community.
8. The custodian wears conservative work clothes which are neat and well kept. He also gives daily attention to his personal cleanliness and appearance.

9. The custodian seeks new and better ways of doing his job, and when he finds them, he puts them into practice.

10. The custodian realizes that he sets an example for many children, and he strives to be worthy of their trust.

QUALIFICATIONS FOR CUSTODIANS

1. Character and Habits
2. Health
3. Intelligence
4. Age
5. Variety of Ability
6. Previous Experience
7. Appearance
8. Education (formal)
9. Pride (self-respect)
10. Marital Status
11. Citizenship
12. English Proficiency

Character and Habits. Good character traits are essential for a custodian. He must be the type of person with whom parents

are willing to have their children associate. He should be dependable and always show courtesy. He should never use intoxicating liquors, drugs, or abusive language around students.

Health. A custodian should be given preference if he is vigorous, strong, alert, and healthy. There is a certain amount of carrying, lifting, and climbing that must be done in his duties. A previous health record can serve as a valuable guide. Good health is important. Most schools require an annual physical examination. The custodian must be free from contagious diseases and from any physical defect that would handicap him in his work. It should be pointed out, however, that many disabled people make excellent custodians.

Intelligence. A custodian must be able to think for himself. The demands of a modern school facility are tremendous.

Age. The minimum age limits normally preferred by those who employ custodians range from 21 to 25, and the maximum age limits from 45 to 50. While these are age

limits desired for new men, it should not have any influence on those already in positions because some of our most reliable custodians do not fall within these age limits.

Variety of Abilities. Because of the varied nature of a custodian's work, he must be able to do a multitude of things, and, hence, he must possess a diversity of skills. He should have some mechanical ability; he should be able to make minor plumbing repairs; he must have a knowledge of electrical work which will enable him to avoid such errors as overfusing; and often, he may be called upon to be a painter.

Previous Experience. Preference is usually given to a custodian who has had previous experience, other things being equal. Experience in a field related to custodial work is valuable if there has been no actual experience as a custodian.

Appearance. A custodian should be neat in his dress and personal appearance. When this is true he will usually take greater pride in his job. A distinctive uniform, consisting of shirt, trousers and tie will tend to enhance the importance of the position. Visitors and teachers will react more favorably

toward the custodian and the school in general if he presents a neat appearance.

Education. It is desirable that a custodian have as much formal education as possible. Many schools give preference to those having at least an eighth grade education. If one has gone through high school he can better appreciate the problems of education and will probably be more cooperative toward the educational program.

Pride. Pride in one's personal appearance and job should be characteristic of a good custodian.

Married Status. In most cases, school personnel prefer a custodian who is married because they feel he is more reliable and more sympathetic to children.

Citizenship. He should be a citizen of the United States and an active resident of the community in which he is custodian. A local resident, as a rule, will take greater interest and pride in his work.

English Requirements. Because custodians have to read extensive directions and other written materials, he must be

able to comprehend the English language. He must keep records and furnish reports; therefore, he must be able to read and write proficiently.

SAFETY AND HEALTH

The safety and health of the teachers, pupils, and personnel. Although this responsibility belongs to the administration, the necessary sanitation and care of the building falls within the job description of the custodian. He must keep close scrutiny over the optimum control of temperature and ventilation, as well as all factors of safety.

GENERAL SAFETY RULES

Know your fire extinguishers. The directions on every type of fire extinguisher in the building must be read, and now is always the best time to do it. It can potentially save the lives of many pupils. Know which extinguisher to use on various kinds of fires, especially electrical fires. People are often electrocuted by using the wrong extinguisher on an electrical fire. Extinguishers must be checked (recharged as needed) and tagged each year.

Exit doors. Keep doors free of chains, locks, and other obstructions while students or visitors are in the building. Passageways must also be kept free of obstructions.

Heating and electrical equipment. Keep electrical and heating equipment in optimal working condition. The custodian can make many minor repairs himself but for those he cannot, he should promptly make a written request for maintenance assistance. (It is helpful to keep a carbon copy of such requests.)

Trash and debris. Dispose of trash and debris daily by burning it in an incinerator or by daily collection.

Catch-all. Don't let any area of the school become a catch-all for items of little or no value. Dispose of them.

Flammable liquids. Liquids such as gasoline, mineral spirits, lacquer thinner, paint thinner, turpentine, kerosene, and alcohol should not be stored in the school if it can be avoided. If it is absolutely necessary, they must be kept in safety cans stored in locked or ventilated storerooms, or in locked metal cabinets.

Oily rags and dirty mop heads. Oily rags and dirty mop heads should be laundered regularly, or burned if they have no value. Oily rags and dirty mops to be laundered should be kept in air-tight metal cans.

SCHEDULE

In order to be functional any schedule must be flexible enough to allow for emergencies. A pre-arranged schedule is often disrupted by special programs or events, particularly around the holidays. Rainy weather, sickness, breakage of glass or equipment, vandalism to school property, special visits by the nurse, doctor, dentist and others often create special cleaning problems that must be given special attention and fitted into a functional schedule.

EPILOGUE

As one can readily see, the roles and responsibilities demanded of the modern-day custodian are many and varied. It is indeed false economy for any school administration to build a multimillion dollar building, and then expect to keep

it functioning at an optimal level with cheap or minimal tools and equipment. It is equally false economy to believe that a school administration can hire a highly dependable custodian for minimum wages. Any discerning person, even with a minimum number of college courses in business and finance, can readily see the necessity for purchasing both qualitative and quantitative tools and materials for a well-paid custodial staff.

CHAPTER II

GENERAL CLEANING

The old adage that an ounce of prevention is worth a pound of cure is the very essence of general cleaning. General cleaning brings the custodian into regular contact with practically every segment of the school plant and enables him to be fully aware of the conditions and needs of the entire building. Few, if any, custodians are truly effective unless they are systematic in their approach toward the total cleaning program. A Custodial Master Cleaning Schedule, which includes not only every cleaning task to be performed, but when it is to be performed, is not an easy task to develop. It usually requires deliberate study in a joint effort on the part of the custodian and school principal, and includes many trial-and-error approaches before it becomes totally satisfactory. The custodian must thoroughly understand the schedule and have a working knowledge of all the tools and materials necessary in carrying out the cleaning program.

Once the custodian has developed a reliable and workable cleaning schedule, which includes every cleaning task to be performed and when, he must then make sure that the schedule is

adhered to at all times, and that the tools and materials necessary to do the job efficiently are kept in sound working condition. If the custodian is determined to see that these two things are well in hand, he is on his way to doing his job in an orderly and effective manner.

One of the most helpful aids to any well organized custodian is a custodian cart. These carts are relatively inexpensive, and in many cases are home made. Their use is invaluable in assisting the custodian in his daily cleaning chores. Carts may be used to store and to carry all the tools and materials that are normally required for daily cleaning. The custodian should make sure that the cart is properly equipped with everything that he will need in order to complete his daily cleaning tasks. This will keep him from having to return to the supply room for additional materials or supplies once he has started his regular cleaning duties.

General cleaning is a broad term that includes both immediate and long range cleaning tasks. Most cleaning tasks such as classroom cleaning are normally done each working day. However, some tasks are performed weekly, monthly, semi-annually, or annually. An important thing to remember is that no matter

when or how often a cleaning task is performed, it should be placed on the Master Cleaning Schedule in order to insure proper attention and care. Cleaning tasks which are performed daily are commonly referred to as Daily Cleaning Operations, while the other tasks are called Other Cleaning Operations.

This chapter is divided into three general areas. The first deals with tools, equipment, and materials which are essential to good custodial care. The second recommends a time schedule for certain cleaning tasks and the order in which the tasks should be performed. The third section describes some of the better methods used by effective custodial staffs, and concludes with recommended precautions concerning the storage and handling of tools, equipment, and cleaning materials.

Although it is generally recognized that custodians have their own special way of doing certain cleaning tasks, it is hoped that they give serious consideration to the methods outlined in this chapter on cleaning. The suggestions and guides presented have been tried and proven by many knowledgeable custodial staffs across the country and should be of considerable assistance.

The difference between being an average custodial staff or a superior one is often determined by whether or not a staff is open to new ideas and suggestions. This choice is yours!

TOOLS, EQUIPMENT AND MATERIALS

As indicated previously a custodial staff can be only as effective as the tools and materials that it has to work with. This is one of the major shortcomings in custodial services today. Millions of dollars are spent to construct a school building but frequently only a few hundred dollars are allotted for the tools and equipment to operate and maintain it. The custodial staff that has adequate materials and supplies is indeed fortunate.

The kinds of tools, equipment and materials which are necessary in maintaining a clean, functional school building are broken into two general categories. One is concerned with the necessary equipment and materials to carry out the day-by-day tasks and the other concentrated on the non-daily cleaning operations.

Daily cleaning operations frequently necessitate some kind of custodial cart which will hold the necessary cleaning

materials. These materials include, among other things, a portable vacuum cleaner that can be used for general dusting and vacuuming, a waste container lined with a disposable plastic liner, and a clip board with an attached maintenance memo pad. The following items also should be placed on the cart before the custodian starts on his regular classroom and general cleaning tour: treated dust mop with a 16" to 18" head on a swivel, a wet mop weighing about 20 ounces with a 60" handle, a 30" to 36" floor broom for the corridor, a 16" to 18" floor broom for classrooms (the corridor and classroom broom are often referred to as floor brushes and are pretreated before using them), dust pan, sponges, absorbent cloths, pretreated dust cloths, chamois cloths for chalkboard and windows, counter brushes, chalk and erasers (for exchanges), waste cans (for exchanges), buckets or pails for the cleaning solution and rinse water, and a general purpose detergent and a neutral cleaner in plastic spray bottles. The custodian cart should also have a small tool chest used for preventive maintenance and include such things as: chair glides, lubricant, pencil sharpener cutter replacements, putty knife, pliers, hammer, screwdrivers (regular and phillips head), wrench

(adjustable), and a small amount of sandpaper, nails, and screws. The custodian should also make sure that he has the following equipment and materials for his non-daily cleaning operations: drop cloths, variety of mops and brooms, squeegee, ladders, mop wringers, extension cords, heavy duty cleaning solutions, neutral cleaning solutions for window cleaning, window covers, and other necessary materials.

It would be difficult to list all the tools, equipment, and materials that is required for any given custodial staff. The important thing is to make a comprehensive survey of the school cleaning problems and acquire those materials and supplies which will enable the custodian to do a superior job.

GENERAL CLEANING TASKS: ORDER AND SCHEDULE

This section outlines most of the cleaning tasks normally classified under General Cleaning. Recommendations are made describing the order in which these tasks should be performed.

DAILY CLEANING OPERATIONS

These include all cleaning chores which are normally performed each school day.

Classroom Cleaning. Classroom cleaning normally should

never take place while class is in session. Most classrooms should be cleaned before or after school. In some instances, if classrooms are vacated near the end of the school day, they can be cleaned separately. However, classroom cleaning normally should be a total and distinct operation and nothing should interfere with the orderly process from the cleaning of the first classroom through the cleaning of the last one.

When cleaning classrooms, the custodian should park the custodian cart (which should be fully equipped for the total classroom cleaning task) outside the classroom door. Upon entering the individual classroom he should do the following: empty pencil sharpener shavings and wipe off cover and handle; look around the room and pick up large pieces of scrap paper and trash and empty these along with the waste basket contents into the waste container on the custodian cart, and then clean the waste basket if necessary. Next, the custodian should erase the chalkboard thoroughly and dry clean it. He should then clean or exchange the erasers and replenish the chalk supply, after having dusted or vacuumed the chalkboard tray and surrounding area. The custodian should then dust the entire room, including window areas, and furniture and equipment in the most

time saving manner. When a vacuum cleaner is available, these areas should be vacuumed rather than dusted. Following the dusting the custodian should then do any necessary spot cleaning; such as removing soiled spots from the walls or furniture, or cleaning the sinks and other areas. He should then give attention to any minor preventative maintenance task, and write down any needed major tasks on his memo pad so that he can take care of them later. The custodian should then dust mop or vacuum the entire classroom, working toward the door. He should then empty the debris into the waste container located on the custodian cart. Following this he should straighten the furniture and equipment, adjust the window covers (while locking the windows), check the thermostat and adjust it if necessary, turn off the lights and lock up the room. The same procedures should be carried out in every classroom.

Other Areas. The library, gymnasium, cafeteria, work rooms, lounge, offices, and generally all other Daily Cleaning Areas follow the same procedures as outlined above. The trash or debris that is swept into the corridor is normally left as the last area to be swept and cleaned.

Corridors. The walls, fire extinguishers and lockers should be vacuumed or dusted from top to bottom. Soil spots and other tasks such as water fountains should be cleaned, checked, and the faucets adjusted. The corridors should then be vacuumed or swept with a treated dust mop.

OTHER CLEANING OPERATIONS

The cleaning tasks described in this section do not normally require daily attention. Regardless of how often they are cleaned, they must be entered on the Master Cleaning Schedule in order to insure that they are systematically checked and attended to. Local conditions, such as the amount of dust, rain, vandalism, and quality of the physical plant have an import on these cleaning operations. The frequency of cleaning recommended in this section refers to average conditions and should not be construed as being absolute.

Chalkboards. Chalkboards should be thoroughly erased everyday. About once each week the chalkboard should be thoroughly dry cleaned. Wet cleaning (washing the chalkboard) should be avoided where possible and should never be wet cleaned over once a year as wet cleaning is harmful to the writing surface.

Window Covers. Window shades and venetian blinds are the two most widely used window covers in school buildings. They both require dusting on an average of once a week, but may require a more thorough cleaning about twice a year. This is normally done during the Christmas holidays and during the summer months.

Windows. Windows normally require cleaning about as often as window covers and both should be cleaned at the same time. Because of rain, wind and snow, outside windows usually do not require a thorough cleaning more than once a year, but they should be cleaned as often as necessary. Thorough cleaning of windows should always be done each summer.

Light Fixtures. Light fixtures which are dirty are not only distasteful to the eye but greatly affect the learning environment of children by cutting down on the intensity of the light. They should be vacuumed or dusted several times a year and thoroughly cleaned twice a year. This cleaning task is usually tied in with the cleaning of windows and window shades and is normally done during the Christmas holidays and summer months.

Furniture and Equipment. Furniture and equipment should be vacuumed or dusted daily. During the summer months they

should be moved into the corridor and checked over carefully for needed repairs and given a thorough cleaning.

Walls and Ceilings. Both of these areas should be vacuumed or dusted thoroughly at least once a month. Under normal conditions they are not cleaned more than once a year, usually during the summer months when the furniture and equipment have been moved to the corridor for cleaning.

PROCEDURES FOR INDIVIDUAL CLEANING TASKS

This section considers each individual cleaning task separately under General Cleaning, and discusses the procedures, tools, equipment, and materials necessary in accomplishing the task.

Pencil Sharpener. Each day the pencil sharpener should be wiped clean with a cloth or sponge dampened with a neutral cleaner. Occasionally, it may be necessary to squirt a drop of machine oil on the moving parts, replace the cutters, or install a completely new pencil sharpener.

Waste Basket. After emptying the waste basket it should be checked and cleaned (inside and outside) with a neutral cleanser. Old or unserviceable waste baskets should be replaced

as necessary without waiting for special requests.

Chalkboards, Chalk, and Erasers. The daily cleaning requirement for most chalkboards is normally satisfied by thoroughly erasing with a clean, dry eraser. About once a week however, many chalkboards, especially where teachers use them extensively (such as in math classes), require a more thorough cleaning. The dry cleaning method usually does an effective job. This involves erasing the board thoroughly with a good clean eraser, and then going over the chalkboard again with a dry chamois or similar cloth. In both of these cleaning methods the chalkboard will continue to appear chalky looking: this is as it should be. The third and final method, short of replacing the chalkboard with a new one, is referred to as the wet method. Generally, it is a good rule to apply the wet method only to slate chalkboards, and then only as the need demands it. Slate is a natural stone which has been quarried, ground, and polished into sheets of about one-half inch thickness. When the chalkboard fails to reflect or accept the writing of the chalk after being dry cleaned, it may be necessary to use the wet method. After the chalkboard has been erased and chamoised thoroughly,

take an abrasive cloth and dampen it with clear warm water only and wash the chalkboard. After the board has dried thoroughly, completely chalk the entire board, just as would be done in breaking in a new board, and then erase the chalking. Rechalk the board a second time, from top to bottom and then from side to side, and then again erase thoroughly. The board should now be ready for use. Should some stubborn spots (ghosts) still remain, use a chemical such as pumice on a damp rag and attempt to remove the spots. If the color of the chalkboard appears on the cleaning rag then it is time to stop, as considerable damage may occur.

One of the best methods of keeping a chalkboard in good condition is to use the right kind of chalk. The best kind is usually white chalk made of limestone, composed of 95-97 per cent whiting, and only 3-5 per cent glueing or binding.

Erasers are equally important as chalk. A good felt eraser attached to a durable back is the most popular one on the market and is quite satisfactory. Another popular eraser is the rubber-leather combination which cleans with the aid of static electricity by attracting the chalk dust.

Dusting. One of the most effective and best all around dusters on the market today is the portable vacuum cleaner. It can be used for practically every dusting task. It is lightweight, relatively inexpensive, and does an extremely thorough job when used with proper attachments. It can be used to clean erasers, vacuum chalkboard trays, walls, windows, window covers, furniture and equipment. A second but less effective dusting technique is to pretreat an abrasive cloth with a good neutral cleaning solution. The abrasiveness of the cloth tends to cut and hold the dust, while the cleaning solution serves to free stubborn dust or dirt loose from the surface. There are various kinds of dusters on the market today: glove type which can be worn over the hand securely, the back-pack portable vacuum cleaner which weighs less than ten pounds, and the mop duster which is used primarily to pick up dust from the floor.

Soiled Areas and Special Areas. Any area within the General Cleaning domain which requires special attention beyond dusting, such as soiled spots on walls or furniture, water fountains, sinks and other equipment are best cleaned by using an abrasive cloth or sponge and a neutral cleaning solution.

After these areas have been cleaned they should be wiped dry with another clean cloth or sponge.

Window Covers. Venetian blinds are dusted best by turning the slats all one way and then vacuuming or dusting that side and then the other. Washable covers and venetian blinds are best cleaned with a sponge and neutral cleaning solution by removing the window covers from the walls and placing them on a clean flat surface. If the slat tapes are of non-shrinkable material, the entire blind can be cleaned thoroughly by placing it in a tank of water mixed with a neutral cleaning solution, and then removing it and placing it into another tank of clear rinsing water. Blinds should be allowed to dry thoroughly before rehanging.

Light Fixtures. Light fixtures can be effectively dusted with either a portable vacuum cleaner or a pretreated dust cloth. A more thorough cleaning job is accomplished by removing the light fixture covers and placing them in a tank of water mixed with a neutral cleaning solution, and then transferring them into another tank of clear warm rinse water. A sponge or abrasive cloth will serve to cut the dirt and a chamois or absorbant cloth should be used to dry the cover

before replacement. The apparatus around the lights can also be wiped with a damp sponge or cloth that has been treated with a neutral cleaning solution. The cleaning of light fixtures is normally a two man operation. While one man is removing the covers and cleaning the lighting apparatus, the other man is on the floor cleaning the covers and rinsing them. This is also an ideal time to replace old bulbs.

Windows. The most widely used tools and materials in window cleaning are warm water, sponge, squeegee, and a good chamois. Occasionally, it may be necessary to add alcohol or ammonia to the water if the windows are extremely dirty. A good sponge can work on any part of the window area without damaging it and can get to difficult areas. The squeegee is an effective tool for removing the water from the window, but a good chamois can thoroughly dry and polish at the same time. However, the polishing of windows takes excessive time which could be better used to clean additional windows. Precautions should be taken to make sure drop cloths are placed at the base of the windows to catch excess water or drippings. Extension rods should be used to reach difficult outside windows.

Furniture and Equipment. All furniture and equipment should be moved to the corridor (or similar area) for a thorough cleaning. This allows another cleaning crew to move inside the classroom and clean the windows, window covers, light fixtures, and ceiling and walls while the furniture and equipment are being cleaned. One important aspect of annual furniture cleaning is the maintenance task that can be performed at the same time. Gliders can be removed and replaced, new bolts or screws can be inserted, and rough places can be sanded and smoothed. Gum and other foreign materials should be removed from the underside of the furniture and equipment while the cleaning is taking place. A good sponge or abrasive cloth and a neutral cleaner are effective materials in cleaning furniture and equipment. Two buckets are required; one for the cleaning solution and the other for warm rinse water.

The furniture and equipment should be wiped dry after cleaning.

Wall and Ceiling Cleaning. Periodic dusting or vacuuming will help maintain the proper appearance of these two areas. Many walls and ceilings are not washable and

special precaution should be taken to ascertain the type of material and paint used on these areas. Spots normally can be removed from acoustical ceilings with art gum or wall paper cleaner. Extremely soiled walls and ceilings are often less expensive to paint than to clean, and this cost factor should be highly considered. When washing these two areas a neutral cleaning solution will usually do the job, and can be applied either with a sponge or abrasive cloth. In some cases a brush might be necessary. Drop cloths should be placed around the work area, and the walls should be cleaned from the bottom up, and the ceilings from the corners inward. Areas three-to-four square feet should be cleaned at a time; and they should be rinsed off and dried before moving to the next three-to-four square foot area. Special precaution should be taken to see that there is no overlapping of areas at the borders, as this tends to highlight the overlapped areas. Special attention should also be given to drippings and streaks. Both should be removed immediately before they dry, as they too tend to show up after the wall has dried.

Cleaning Solutions. A neutral cleaning solution will generally accomplish most cleaning tasks around the school without too much difficulty. Custodians should be fully aware of the chemical make-up of all the cleaning detergents and solutions which they use. Most of the neutral solutions have an ammonia, alcohol, tri-polyphosphate, or similar base. Chemical solutions with an unknown base should be avoided. When a custodian mixes his own cleaning detergent or solution he must follow the exact directions of the manufacturer.

SUGGESTED TIME SCHEDULE

Task	Daily	Weekly	Semi-Weekly	Annually
Pencil Sharpener	x			
Waste Basket	x			
Chalkboard:				
Erased	x			
Dry Cleaned		x		
Wet Cleaned				x
Dusting or Vacuuming:				
Chalkboard Tray	x			
Walls (reachable)	x			
Window Area	x			
Furniture and Equipment	x			
Spot Cleaning:				
Soiled Spots	x			
Sinks	x			
Water Fountains	x			
Floors (mop dusted)	x			
Window Covers			x	
Windows			x	
Light Fixtures			x	
Furniture and Equipment				x
Walls & Ceilings				x

STORAGE OF CUSTODIAL EQUIPMENT AND MATERIALS

A custodial storage room that is well organized and large enough to store all the materials, tools, and equipment is highly recommended. A large pegboard and plenty of shelf space are necessary. A running inventory of all materials, tools and equipment should be kept in an accessible place.

Shelf space adequate for the storage and rotation of paper goods, cleansers, small equipment and other supplies should be provided. Racks for brooms, mops and brushes are also needed. This aforementioned rotation should be done by marking the date each new shipment arrives and placing it behind existing materials and supplies, in order that the older materials are used first to avoid ageing and spoilage. The following recommends appropriate procedures for the storage and maintenance of tools and equipment:

Brushes (Floor). These brushes should have the head turned frequently to eliminate deforming. Hang the brushes with the bristle down. This will allow a wet brush to drip dry properly.

Buckets. Each bucket should be marked or identified as to purpose, such as scrubbing, rinsing, or waxing, and should not be interchanged. Buckets should be rinsed and wiped dry after use to prevent rust and corrosion.

Carts. All custodian carts should be stored in a place that will not interfere with foot traffic or create a safety hazard.

Chamois (Chalkboard). These should be shaken out well after use, and stored in a place free from oil, grease, water, wax and other foreign materials.

Chamois (Window). These should be washed, rinsed and allowed to dry on a rack provided for this purpose, and not dried in the sun or next to a heating unit.

Cleaning Materials. All cleaning materials, other than flammable liquids, should be stored on shelves and clearly marked as to content.

Corn Brooms. Should be hung on suitable hangers with the bristle down but not touching the floor. Wet the bristles of a new broom prior to the first usage. When using the broom turn frequently to eliminate deforming.

Counter Brushes. These brushes should be hung on hooks to allow them to retain their shape.

Dust Cloths. These should receive the same treatment as dust mops, and stored where they will not come in contact with other materials.

Ladders. Ladders should be kept in good repair and in a room away from the reach of children. Long ladders should be hung on pegs attached to the wall.

Liquids (Flammable). Alcohol, gasoline, paints, thinners, kerosene, and similar flammable materials which are kept in the school building should be stored in a metal fire proof cabinet. Where possible, these items should not be kept in the school building.

Mops (Dust). These mops should be treated with a non-oily treatment and stored in an air tight metal container for a 24-hour period prior to usage. Shake and fluff mops after using and place on hanger. Never clean mops by striking against a wall or other hard object. The mop heads should be changed, laundered and retreated once a week or as necessary.

Mops (Wet). Each mop should have a hanger marked for its specific purpose, such as scrub, rinse, or wax. Each mop should then be rinsed, combed and fluffed before storing. These mops can be hung with the head either up or down but always hung, and never touching the floor.

Mop Wringers. Mop wringers should be rinsed and cleaned, and the strings and debris removed after each usage. They should then be placed on the mop buckets to dry.

Rags (Oily). These rags should be stored in an air tight metal container. When no longer serviceable, they should be destroyed by burning.

Rags (Wet). Wet rags should be rinsed and spread on a rack to dry in a well ventilated area. Do not hang over equipment.

Sponges. Sponges should be rinsed daily and placed on a rack to dry.

Squeegees. Wipe squeegees clean and hang so that the rubber blade will not touch other materials.

Vacuums. Vacuums should be kept in a storage room with the hose and other attachments on a pegboard or a storage board.

CHAPTER III

RESTROOMS AND RELATED FACILITIES

No single area of the school plant reveals the quality of the custodial program more readily than does the restroom and shower area. The remainder of the school plant may demonstrate excellent custodial service, however, if the restrooms and showers are soiled and odorous, the total program may be severely critized. The general efficiency of the custodial staff is often judged by the maintenance of these areas.

Public health, public relations and professional pride demand that the restroom maintenance be of acceptable quality. The excellence of this service has educational implications for habits and attitudes of the pupils. It may be of a positive or negative influence on student behavior and thus offers an educational challenge to the custodial program of the school. Pupils tend to respect a clean orderly restroom, but have little regard for one that is soiled and untidy.

PROBLEMS OF RESTROOM SANITATION

The greatest problems in maintaining restroom and shower sanitation are bad odors, poor lighting, and improper temperature.

Poor Ventilation. Bad odors are of two types: (1) the temporary odors that result from the process of removing waste materials from the body, and (2) permanent, lingering odors arising from unclean fixtures, urinal traps, urine stained floors, stained partitions and decayed organic compounds. The first type of temporary odor generally is quickly removed by an adequate exchange of fresh air, or ventilation. The serious type of odor, the permanent lingering type, is the result of unclean conditions, improper building materials, and improper care of the urinals and commodes. Four particular sources of bad odors are noted: (1) soiled toilet seats and stools, (2) soiled urinals and traps, (3) soiled and stained floors (especially concrete and terrazzo floors), and (4) soiled wainscot and certain partition materials.

Bad odor constitutes one of the main problems of restrooms and shower room sanitation. The two ways to

eliminate this problem are (1) proper ventilation to remove polluted air, and (2) good cleanliness to remove the source of the odor.

The use of deodorants has been highly questioned. The purpose of a deodorant is to neutralize or offset the disagreeable effects of a bad odor. It is not, however, a disinfectant but merely substitutes one odor for another. In most cases, deodorant blocks or sprays are merely used to cover up a dirty restroom or shower room. Since clean restrooms and showers do not smell, deodorants (perfumes) are not needed or recommended.

Special attention should be paid to the ventilation of the shower room and adjoining dressing rooms. Lockers should be designed and located for maximum ventilation.

Poor Lighting. Poor lighting has been noted as another problem in restroom and shower area sanitation. Where there is poor illumination, the occupants tend to take less care of the facilities. Consequently, light bulbs should be cleaned or replaced when necessary. When painting, light colors should

be chosen since light hues reflect more light. Epoxy paint in high use areas, such as restrooms, offers more protection and ease of maintenance than latex or enamel type paint.

Improper Temperature. Under certain temperature and air movement conditions, there is little exhaust action even when the windows are open. For example, on cold days the warm air within a building may tend to rise through open stairwells and create a suction action that will cause the outside air to be drawn in through the open toilet room window, driving the toilet room odors into the building corridors. If a custodian must depend on window ventilation, he should study the various conditions that will influence the ventilation and make proper adjustments.

Restroom odors become more noticeable as the temperature within the room rises. Consequently, the temperature should be maintained at an optimal level. While the noted desirable temperature for classroom areas is 70 to 75° Fahrenheit there is no reason why restroom temperatures should be that high. Children are not expected to remain in these rooms for any extended period, and loitering

should be discouraged. A temperature of 67° Fahrenheit is not unhealthful for the limited time children must remain there and the odor conditions are vastly improved.

The temperature for the shower room and dressing rooms should be maintained at 70° to 75° Fahrenheit; keeping in mind that the heat from the showers will raise the temperature in the immediate shower area.

TOOLS, EQUIPMENT, MATERIALS AND SUPPLIES

Tools and Equipment	Number Needed
Buckets (10 quart size)	2
Sponge (cellulous)	1
Rags (clean)	2
Pot Brush	1
Putty Knife	1
Mirror (small handle type)	1
Rubber gloves (pair)	1
Plunger or plumber's friend	1
Floor Bucket (32 quart size)	2
Wringer to fit bucket	1

Tools and Equipment Continued:	Number Needed
Wet Mop	1
Dust Pan	1
Radiator Brush	1
Squeegee	1
Hose	1
Toilet Brush (curved handle)	1

Materials (Chemical)

Neutral Cleaning Agent/Solution

Acid Bowl Cleaner

Supplies for Replacement

Towels

Toilet Paper

Hand Soap

Sanitary Napkins

Light Bulbs

PROCEDURES

RESTROOM CLEANING

Remove waste daily. Collect all loose debris and trash. Empty waste cans.

Check and refill dispensers. Towels, toilet paper, hand soap, sanitary napkins.

Sweep floor. Remove loose material and gum from floor.

Dust. Include all ledges, toilet partitions, and surfaces requiring dusting.

Clean fixtures and wash basin. First wet down the basin. Using the pot brush, and neutral cleaner solution, clean the basin inside, outside, and underneath. Be sure to wash surrounding wall area and piping under basin. Do not use an abrasive cleaner or acid cleaner on sinks. Rinse solution from basin. Wipe basin with a wet sponge of clear water. Wipe chrome with a paper towel. Inspect for maintenance needs as it is being washed.

Cleaning mirrors. Mirrors in the restroom should be cleaned with clear water and a clean cloth. After washing, the glass should be wiped dry with a chamois or paper

towel, wiping vertically from top to bottom of mirror.

Cleaning urinals. The urinals and all adjacent areas should be cleaned at least once a day. Flush urinal and check water inlets and traps. Using a paper towel or pair of gloves, remove waste found in urinal. Using a neutral cleaner solution and a pot brush, wash outer surface of urinal and adjacent wall areas. Wash the urinal, including metal plumbing. Be sure to wash thoroughly the hidden under surfaces of the rim. Use the hand mirror to check cleanliness of hidden surfaces. Flush urinal and rinse the exterior with the sponge. Wipe the chrome with a dry rag or paper towel to polish.

Traps. Weekly, check and clean the urinal and floor traps. One cup of detergent solution may be left in traps overnight on occasion to combat odor and soil buildup in the trap.

Toilet cleaning. Flush the toilet and look for stoppage, clogging, and foreign objects. Use the plunger if needed. Force as much of the water over the trap as possible. Use the bowl brush and a rapid downward pumping action.

A "plumber's friend" can be used to reduce the diluting of the cleaner, which will be added next. Proceed to each stool, repeating the same procedures. Return to the first stool. Using the small hand mirror, check the groove of the stool which is hidden from sight. If it shows a dark soiled stain or ring, use an acid bowl cleaner on the johnny mop or curved toilet brush and clean thoroughly. This is one source of permanent lingering odor. Don't allow the acid cleaner to splash on the exterior; if this occurs, wash it immediately with water. Flush toilet; while flushing, wash the acid cleaner from the underside of the rim. Rinse the bowl brush while flushing. Inspect under the rim or groove with a small hand mirror for cleanliness. Repeat the acid cleaner if soil is found. Wash the seat, hinge fittings, and exterior of the commode with neutral cleaner and pot brush. Wipe the areas with clean water and sponge. Wipe the chrome parts with a paper towel or dry rag for a polished effect.

Spot Cleaning. Remove finger prints, stains, and other markings from toilet partitions, doors, frames and walls

with the neutral detergent solution and wipe with clear water and sponge.

Maintenance check. Check all light fixtures and other mechanical equipment, such as ventilation, for cleanliness and proper working order.

Floors. Using the materials, equipment and procedures described in Chapter IV on floors, clean the floors daily.

SHOWER ROOM CLEANING

Inspection. Check and refill hand soap.

Dust. Include all ledges and horizontal surfaces in adjacent areas.

Clean fixtures. Include shower heads, soap dishes and adjacent wall and floor areas, using a neutral cleaning solution and pot brush. Rinse all ceramic tile in the shower area including walls, and ceilings, with warm water and hose. Wipe the fixtures with a dry cloth or paper towel.

Clean floors. See Chapter IV.

CLEANING OF RESTROOMS

The recommended time for cleaning the restrooms is the late afternoon when most of the building occupants have left the school. Shower rooms should be cleaned after the last use of the showers in the afternoon.

SUGGESTED TIME SCHEDULE

Task	Daily	Weekly
Restrooms		
Dust	x	
Clean basins	x	
Clean urinals	x	
Clean toilets	x	
Clean floors	x	
Replace supplies	x	
Perform needed maintenance	x	
Spot clean walls and toilet partitions	x	
Check urinal trap		x
Check floor trap		x
Wash walls		x
Shower Room		
Clean shower heads and fixtures	x	
Clean walls	x	
Clean floors	x	
Dust	x	
Sweep appropriate areas	x	

PRECAUTIONS

Special attention should be given to toilet facilities cleanliness because of the germ spreading factor found in unclean restrooms and shower rooms. Custodians should be careful to wash their hands after cleaning these areas before continuing cleaning operations in other parts of the building.

Special caution should be used when cleaning the toilet and metal shower dividers. Dividers should be dried thoroughly with special attention given to the ledges at the bottom.

CHAPTER IV

CARE AND MAINTENANCE OF HARD FLOORS

Floors are the custodian's showcase. With the exception of the building exterior, probably no other area of the school plant portrays the quality of the custodial staff as conspicuously as the floors. The visitor sees the corridor floors immediately upon entering the school. His opinion of the entire school is at that time beginning to formulate.

If a good image is to be created with clean floors, the custodian will need to know floors and floor cleaning techniques. The quality of floor maintenance will improve as the custodian improves his knowledge and skill.

Common resilient floors include asphalt, asphalt tile, linoleum, rubber tile, vinyl, vinyl asbestos and cork. The physical characteristics of any flooring material always govern the methods of maintenance and the products which are chosen to properly treat and maintain it.

TOOLS AND EQUIPMENT

Treated Dust Mops

Treated dust mops are the most important single item in the maintenance program of a school. The best types have swivel handles. Untreated dust mops are not recommended, as they merely stir up the dust, rather than pick it up.

Types of Dust Mops. The first expenditure for equipment should be treated, dry dust mops. One treated mop, size 16" to 18", will adequately dust five classrooms.

Care of Treated Mops. Treat the mops one day prior to using them. Mops 30" or wider should be used for corridor areas. Hang the mops in a head-down position overnight so that capillary action will move the treatment to the ends of the strands. Only a mop treatment solution that has been recommended by a reliable janitorial house should be used.

To clean the mop place it in an appropriate solution, and allow it to soak overnight. Then wash and rinse the mop in an old washing machine for four to five minutes, if possible. Untangle the snarls and hang the mop to dry before retreating it.

Wet Mops

Each custodian needs a minimum of four wet type mops. These will be used as follows: one for scrubbing, one for rinsing, one for waxing, and one for sealing.

Types of Wet Mops. The best type of wet mop is a synthetic. Rayon is commonly used as it will normally last a little longer. Tests have indicated that it does a much better job, has the same absorbent factor as cotton, and will not streak or leave fibers as cotton mops often do. Several types of mops are available: flip top, spring type, big bulky type with wing nut (not recommended as it may rust rapidly), granny type with knot on top (rots quickly), and screw type.

The best weight in a wet mop is 20 ounce for most tasks such as mopping, sealing, and waxing. A male custodian normally requires a 60" handle, but a maid can better utilize a 54" handle on a 16 ounce mop. The 32 ounce mop is too large for anyone, and may create backache or twisted-spine problems.

Care of Wet Mops

Wet mops should be cared for in the same manner as

dust mops. The cleaning process works equally well for both kinds.

Scrub Buckets

The best type is one with a 32 quart capacity. It should be on casters, and a wringer (push-down type) should be attached on the side. The wringer should accommodate a 20 ounce mop. Each custodian should have a minimum of two buckets because one should be used for mopping and the other for rinsing.

Push Brooms

Each custodian should have at least two push brooms. These should be the natural bristle type with a 16" - 18" head. These brooms are used mainly for restrooms and heavily littered areas.

Floor Machines

The larger the machine the easier it is to operate (up to a size of 23"). A 17" machine is designed to take care of approximately 10,000 square feet; a 20" machine will service 15,000 square feet; and the 23" machine will handle 20,000

square feet and over. A 23" machine can ordinarily do an area in half the time it requires a 17" machine to do.

Floor machines come in different weights and sizes, and the revolutions per minute will vary with weight and manufacturer. A floor machine should be wired for both 110 and 220-volt circuits so that it can be converted by merely flipping a switch.

The floor machine is designed to create friction. This implies that you need to know how much pressure per square inch is on the brush since this determines the machine's value. It should have approximately 2.3 pounds per square inch. If the motor is off-center, the machine will often be off-balance. The better kinds of machines are built low.

A stiff wire brush instead of a scrubbing or polishing brush should be purchased. Nylon pads can then be used on the brush for different jobs. Pads are designed for stripping, light scrubbing, buffing, combination, and high gloss. Three to four dozen pads can be purchased for the cost of only one scrubbing brush. Nylon also does a better job and lasts longer. The best way to economize on materials is to standardize.

A floor squeegee or wet/dry vacuum is helpful when using

a floor machine. Wet/dry vacuums are rated by the amount of water sucked up per minute. The motor should be one to one and one-half horsepower.

Miscellaneous Tools

Some of the other tools which are desirable in the care and maintenance of hard floors are: counter brush, dust box, dust pan, putty knife, corn broom (for outside areas), and clean cloths (an ample supply). These tools should be carried in the custodian's cart, if one is available.

PROCEDURES

Sweeping Classroom Floors

If there is a secret to efficient room cleaning, it is -- bE SYSTEMATIC. Have the equipment and materials needed to do the job; have it organized to eliminate unnecessary steps and lost motion; and know how to use them. An inexperienced custodian may use as much as forty per cent of his time in needless and unproductive efforts to transport materials and equipment, i.e., looking for things, or trying to figure out what to do next.

In sweeping classroom floors a swivel-head treated dust mop (16 to 24 inches) should be used. Begin at the door and work around the edge of the room to the far corner. Work under and around the furniture, and push the dirt into the aisles without lifting the dust mop. Use a circular (figure eight) motion. After cleaning under a row of desks or chairs, mop the aisle, finishing up at the doorway entrance. When the dust mop becomes full with dirt and dust, push it through the door into the corridor, lift it a few inches and give it a sharp, quick shake. Do this far enough away from the corridor wall so that dust will not be deposited on the baseboard or door ledges. Pick up the dirt with the dust pan and floor brush and place it in the dust box. This should not be done directly in front of the door as a draft may scatter some of the dirt. One treated dust mop will normally sweep five classrooms adequately.

Sweeping Corridors

Place the tools at one end of the corridor away from the walls and woodwork. Take the floor brush and sweep the outer edges of the corridor (12-15 inches from the wall), insuring removal of dirt from corners, and under lockers. If the

corridor is in use, the first round trip should be along the walls so that foot traffic will have a clean place to walk. Continue sweeping until the corridor is completely swept, shaking the dust out of the mop at the completion of each round trip. Each trip should overlap the previously swept strip by about four inches.

Sweeping Stairways

There are different types of stairs and treads that may require slightly different tools or procedures for sweeping. Most modern stairways can be swept with a treated sweeping mop. However, there are some stairs so constructed they may require the use of a floor brush. Stairs having square corners or rough, grooved treads are more difficult to sweep than stairs with rounded corners and smooth treads. A floor brush is the best tool to use on stairs of this description.

In sweeping stairs situated between two walls, the sweeping operation should begin at the bottom of the stairway. Sweep the dirt from one side toward the center of the tread on the way up. When the top of the stairway is reached, the dirt is then swept from the other side toward the center; then down to the

next lower step, using a slight jerking motion in the corners. This procedure is continued downward to the foot of the stairs where the accumulated dirt can be picked up in the usual manner. This method can also be used on stairs having an open grill on one side and a wall on the other; but in this case, the side next to the grill should be swept on the way up. This method of sweeping allows traffic to use one side of the stairway while the other side is being swept.

When sweeping stairways situated between two rails, it is necessary to sweep from each side to the middle of the stair. This will keep the dirt away from the edge and prevent it from falling to the floor below. Stairs having a traffic rail in the middle sometimes offer an additional inconvenience for sweeping, but can usually be swept by the same method indicated above. Wide entrance stairs offer a different problem but are not too difficult to sweep unless the total width exceeds twelve to fourteen feet. The best method of sweeping is to sweep from the bottom on one side toward the top, taking about one-half the width of the stairs on the way up, and the other half on the way down. However, if the stairs are extremely wide, it

may be necessary to sweep from the middle toward the edges all the way up, and bring the dirt down at the wall side of the stairs, making a trip to complete the opposite side.

Quietness is an important factor in the process of sweeping stairs, especially if done during school hours.

Sweeping Gymnasiums

Place the tools at one end of the gymnasium away from the walls and woodwork. If there is soil around the edges, take a floor brush and sweep the outer edges first, insuring removal of dirt from corners, and other confined areas. Begin at one end where it would be better to pick up the debris. Return trips should overlap previously swept strips by at least 4-6 inches. Continue sweeping in this manner until the gymnasium is completely covered, shaking the dust out of the mop at the completion of each round trip. Pick up the dirt, using the floor brush and the dust pan and deposit it in the dust box.

Mopping Floors

Damp Mopping. Sweep the floor first and remove any foreign matter sticking to the surfaces. Arrange movable

furniture in a manner which will simplify the mopping. Dip one mop in the neutral solution and wring out slightly. Mop along the edge of the floor for a distance of about fifteen feet, coming no closer than six inches to the baseboard. Swing mop with a side-to-side (figure eight) motion until the entire floor area is covered. Dip a second mop in clean rinse water, wring out slightly and rinse floor, again using the figure eight motion for application. Redip the second mop in clean water and wring out thoroughly. Dry the floor as much as possible with this mop by repeated rinsing and wringing of the mop, covering the entire area.

Wet Mopping. This process is the same as damp mopping, except the mop head is saturated with cleaning solution in the beginning. It is then mopped onto the floor and allowed to remain for a short period of time in order to loosen the dirt. The solution is then removed with the mop and rinsed with clean hot water just as in the damp mopping process.

Scrubbing Resilient Floors

On new floors allow sufficient time for the tile to become tightly adhered to the floor before washing. The

original scrubbing after installation should leave the floor absolutely free of any surface coating or foreign matter.

Utilizing a proper cleaning solution, use a floor machine to loosen dirt and old wax. Use a Number 2 steel wool pad or a nylon pad for stubborn dirt. Using a curved squeegee, push the water into an area where it can be picked up (either with a mop or a wet/dry vacuum). Use an 18" straight squeegee to pull the water into the pick-up pan (or use the wet/dry vacuum).

Rinse the floor with a fresh mop and clean water as each area is scrubbed. Do not overwet the floor or allow the water to stand. Change the rinse water often to insure a thorough job. Never mix the rinse mop with the scrubbing mop. Allow the floor ample time to dry.

Waxing Resilient Floors

Use a sheepskin applicator (for small areas only) or a clean rayon mop (for larger areas) to apply a thin coat of water emulsion wax. If necessary, apply a second coat after the first coat is thoroughly dry.

The wax used should contain no drying oils, no brittle

shellacs, resins, paint ends or other quick-dry materials to hurry the natural process and cause the finish to be brittle. If possible, keep foot traffic off the floor for a few days to enhance the beauty of the floor. Color hues in the floor surface will be brought into high relief, and the floor should require no further waxing for several months, except in entrance ways.

In using the sheepskin applicator, a small open pan is needed for the wax. Both the floor and the applicator must be clean. Apply the wax in thin, even coats using smooth strokes. Taper the end of the stroke, and do not rub or brush in the wax. Allow to dry thoroughly before applying a second coat.

In using a rayon mop to apply the wax, the mop should first be soaked in water to soften it and wrung out dry. The 20 ounce size is ideal for waxing large areas. Place the liquid wax in a clean mop bucket with a wringer attached. Dip the mop into the wax and wring out about three-fourths dry. Apply the wax in thin coats. Avoid heavy waxing in order to prevent milky streaks. Allow the wax to dry overnight before polishing for maximum lustre.

Sealing Resilient Floors

Make sure that the newly-laid floor is absolutely clean and dry, and that the surface is free of all foreign matter. Apply the undercoat seal in a thin, even coat with a sheepskin applicator or clean rayon mop to fill all pores and pits in the surface. To insure that the seal is thoroughly dry before waxing, allow it to cure overnight.

Care of Resilient Floors

When the condition of the floor warrants care (usually twice annually), scrub it with a light solution of neutral cleaner. After permitting it to dry, polish to a rich lustre.

The floor should be swept daily (see work schedule) with a treated dust mop. Frequently shake the mop to free clinging dust and dirt particles.

The wax finish should be periodically mopped with a neutral cleaning solution (see damp mopping instructions). This can then be followed by buffing instead of re-waxing in order to bring out the lustre of the floor. This eliminates frequent stripping of the wax.

After several months traffic you will want to patch in

traffic lanes or heavily-used areas. Doorways and halls are examples of such areas. It is unnecessary to re-wax the entire surface because buffing will blend in the patched areas.

Twice annually (more often if necessary) the floor should be stripped by thorough scrubbing and re-waxing. Use a heavier solution of neutral cleaner than required for light mopping. Spread the solution onto the floor with a rayon mop and work the area well with a floor machine and a nylon scrubbing pad. After removing the solution, and rinsing well, allow the floor to dry completely before re-waxing.

Care of Terrazzo Floors

Follow the general directions for maintaining resilient floors. The only exception is in damp mopping. If all residue is carefully picked up, it is not necessary to rinse after mopping since the clean film of a cleaner actually enhances the lustre of the terrazzo. For white terrazzo scrub and mop with a solution which keeps the floors white.

Products for Terrazzo Maintenance

A neutral cleaner (free from acids, alkalis, metallic

salts and damaging abrasives) should be used on terrazzo or any other types of hard flooring material. A special cleaner, formulated for white terrazzo and concrete, plus a whitening agent which prevents yellowing and preserves the original whiteness of the floor should be used.

A powdered cleaner which attracts and removes grease, oil, and soap film from Portland Terrazzo and other hard-surfaced floors is highly recommended. This cleaner has a bleaching effect on many non-removable stains.

Use a buffing type of terrazzo sealer that produces a tough, trackless, slip-resistant surface and never requires waxing. This type of sealer will not flake off or show traffic lanes. It brings to life the color hues that may have become dull and lifeless and aids in preventing efflorescence, bleeding bloom and dusting. Protection against penetration by water, dirt, and traffic wear is provided. It also makes daily dusting easier and eliminates frequent scrubbing.

A non-buffing type of sealer is a water emulsion, long wearing polymer coating. This seals and finishes porous surfaces with a color restoring beauty and protection. It is

easily applied, highly slip-resistant, repels soiling, and resists water spotting.

Use a non-buffing, penetrating, quick-dry sealer for terrazzo surfaces which are exposed to acids, oils, alcohol, grease and water. This type sealer is excellent for sealing old porous terrazzo and restores colors while resisting soiling and water spotting. This long-wearing surface facilitates cleaning and can be patched without recoating the entire floor.

SUGGESTED TIME SCHEDULE

Cleaning Task	Daily	Weekly	Monthly	Annually
Sweeping classrooms	x			
Sweeping corridors	x			
Sweeping stairways	x			
Sweeping gymnasiums	x			
Mopping floors (damp)		x		
Mopping floors (wet)			x	
Scrubbing floors				2-3 times
Waxing floors				2-3 times

What is a Neutral Cleaner?

We must refer to a technical scale of comparative values (see pH Table). Chemists use the term "pH" to express the relative alkalinity or acidity of a liquid.

Practically all detergents have a pH factor between 7 and 14. In other words most of them are alkaline. In a compound where the hands are exposed for any length of time, the pH should not exceed 10.5. Any greater amount of alkalinity can dry out the skin oils and cause irritation.

In the floor treatment industry the accepted "neutral cleaners" fall in a pH range of from 8 to 10. To better understand this, study the pH Table. For example, a pH of 9 is not just slightly more alkaline than a pH of 8, it is in fact 10 times more alkaline.

pH TABLE

	Material	Approximate pH Value	Relative Acidity or Alkalinity in terms of Pure Water
		0	10,000,000
	1% Muriatic Acid	1	1,000,000
	1% Oxalic Acid	2	100,000
Acid	Vinegar	3	10,000
	Soft Drinks	4	1,000
	1% Boric Acid	5	100
	Cow's Milk	6	10
Neutral	Chemically Pure Water	7	1
	1% Sodium Bicarbonate	8	10
	1% Borax	9	100
	Neutral Liquid Soap	10	1,000
Alkaline	1% Ammonia	11	10,000
	1% Trisodium Phosphate	12	100,000
	1/2% Caustic Soda	13	1,000,000
	4% Caustic Soda	14	10,000,000

Advantages of Neutral Cleaners

Neutral cleaners can be used safely on any washable surface. They contain nothing injurious to floor surfaces and are effective in hard or soft water (hot or cold). Another advantage lies in its gentle, thorough cleaning ability. Whereas most cleaning products depend on one or two cleaning processes, a good neutral cleaner provides 100% cleansing action by combining many different processes.

The use of wetting action breaks the surface tension and gets the liquid directly on the contact surface. Penetrating action gets the solution down into the pores and crevices of the surface. The sudsing action attracts (pulls) dirt particles into the suds. The suspending action holds insoluble particles in suspension and does not allow solid particles to settle, which makes it easy to remove them from the surface. Emulsifying action breaks up fats and oils and mixes them into the water. It actually separates oil and makes it easier to remove. The dissolving action causes a breakdown of soluble materials which gravitate into the solution and reduces the cleaning time in half.

Just because the pH factor falls within the neutral range

does not mean that the cleaner is safe. A cleaner which contains phosphates can form destructive crystals that often break up floor surfaces.

For the pH of some common substances refer to the preceding table (pH Table). When purchasing a neutral cleaner contact a reliable janitorial supply house.

PRECAUTIONS

General

In order to avoid soilage, do not place soiled tools against walls or furniture as this will cause the custodian extra work in keeping the building clean.

Wash, rinse, and dry all mops after each usage in order to prolong their life. An adequate supply of mops should be available to permit usage of a fresh mop each day. This allows proper time for cleaning and drying of all used mops.

Keep the sweeping mop clean and treated. After treating, the mop should be left overnight to allow the treatment to properly set. This prevents smearing the treatment on the floor.

Do not shake mops near baseboards or furniture. This causes the dust to settle on these areas and adds to the work load of the custodian.

Make sure that all windows on the first floor (and in the basement) are securely locked. This is a general rule to discourage vandalism and break-ins.

Store sweeping mops (clean and treated) with the head down, preferably with the head in a metal box. This prevents the treatment from getting on the handle, and the metal box will prevent the treatment from rapid evaporation.

Sweeping Floors

Do not empty floor sweepings into paper containers, use a dust box. Paper containers have a tendency to allow dirt particles to "spill", whereas a dust box is specifically designed to hold floor sweepings until the custodian is ready to dispose of them.

Sweep corridors and gymnasiums in the direction in which they are laid out. By sweeping these types of floors in the prescribed manner, the custodian will pick up the dirt that normally gathers in the seams of these floors.

Carry a counter brush to use in corners and under lockers. These areas are difficult to reach with brooms or mops, and the dirt and dust will gather if not removed regularly.

To erase streaking, run the sweeping mop over the floor where dirt has been picked up. If these streaks are allowed to remain, they will be ground into the floor and will require extra effort to remove them.

Mopping and Scrubbing Floors

When mopping, remove the cleaning solution thoroughly. If the solution remains on the floor, it may cause the floor to deteriorate rapidly.

When mopping immediately remove all water splashed on furniture and baseboards. This water may cause spotting and could lead to permanent damage.

Use a cleaning solution that is strong enough to clean, but mild enough to prevent stripping. If the solution is too weak, the custodian is wasting his effort. If the solution is too strong, the wax may be stripped from the floor and necessitate re-waxing.

Do not drag objects over a wet floor. This can cause

streaking and may harm the wax or the floor. It may also cause permanent damage to the floor surface.

When scrubbing, do not attempt to scrub too much area at one time (limit to area approximately 4 ft. x 6 ft.). If too much area is covered, the solution will dry before it can be removed, and can permanently damage the floor.

Do not leave cleaning solution on the floor over five to eight minutes. The solution may penetrate the floor and cause permanent deterioration or a loosening of the binding materials in the floor.

When mopping and scrubbing avoid tracking of clean areas, and watch for slippery floor surfaces. Any areas which are tracked will need to be re-mopped or re-scrubbed. A wet floor is slick and can easily contribute to accidents.

Waxing Floors

When waxing floors a water-emulsion wax is superior to a spirit-solvent wax:

(1) water emulsion wax presents no fire hazard.

(2) water emulsion wax may be used on all types of flooring materials.

(3) water emulsion wax does not require buffing to produce a good lustre.

(4) water emulsion wax is less slippery.

Use different mops and pails for each operation such as mopping, rinsing, sealing, and waxing. This technique will prolong mop life as well as insure that the floors will remain in sound condition.

The temperature of the rooms and the materials to be used should be above 70^{o} Fahrenheit. This caution should be followed when sealing or waxing a floor.

Do not clean resilient floors with gasoline, turpentine, benezene or naphtha. These agents will soften and discolor the flooring materials. Soaps and cleaners containing fats, oils, alkali, or acids should never be used on asphalt or rubber tile.

Never use strong soaps or cleaners instead of a good neutral cleaner for proper floor care. Strong soaps are the frequent contributors of floor trouble and cause more damage than constant wear. Fading and discoloration can result and may actually cause the floor to slowly wash away.

Most strong soaps combine oil with a strong alkali such as lye. Alkali attacks the basic ingredients of most resilient floors, causing them to become brittle and hard and subject to easy chipping and cracking. The alkali may also cause a chemical change in color pigments and result in discoloration.

Do not use cleaning agents which are not readily soluble in water or strong detergents. These types of agents will dull the lustre and leave a white looking film.

Do not use varnishes, lacquers, shellacs or other plastic finishes on floors as these materials usually contain solvents that can permanently damage the flooring.

Sweeping compounds usually contain oil which is a fire hazard. Many of them also contain sand which is difficult to sweep and often will abrade if left on the floor.

The U. S. Bureau of Standards conducted a series of tests for several years which indicated that terrazzo floors were damaged when cleaners containing free alkalis, soda ash, and TSP)trisodium phosphate) were used on them. This damage occurred in the cement matrix where crystals formed from deposits of the cleaning agent and "exploded" the floor.

Supervisors, administrators, and custodians should become fully cognizant of the many pitfalls and dangers of purchasing supplies and equipment from dubious janitorial supply firms. Secondly, each new or unfamiliar product, even from reputable firms should be given special caution and attention. Knowledgeable custodians will never guess at the amount of a product to use but will always abide by the manufacturer's directions.

CHAPTER V

CARE AND MAINTENANCE OF CARPET

The use of carpet in schools has grown substantially in recent years. Carpet enhances the learning environment of a school. It aids in sound control, adds beauty, makes the school safer; and more importantly to the custodian, it cuts maintenance time.

The succinct fact that carpet cuts maintenance time does not mean that it is carefree. The most important aspect of carpet maintenance is daily care. A good program of daily care will maintain the appearance level of the carpet and lengthen the time between cleanings. A program of daily care insures that the sound control properties of the carpet are maintained, and the life of the carpet is prolonged.

To maintain carpet, an important factor for success is the availability and proper use of the correct tools, equipment, and materials. No procedure will work if the proper tools and supplies are not available. For proper carpet maintenance the custodian should be equipped with the following tools and equipment:

Vacuum Cleaner. Proper selection of a vacuum cleaner is of utmost importance. A heavy duty commercial type, available from most manufacturers, is a must. This upright type of heavy duty vacuum is necessary for the large carpeted areas of a school. There are several important features which the school vacuum cleaner should include: (1) separate motors to drive the suction system, and the beater brush or turbulator, (2) a one-horsepower motor for suction, and at least a one-half horsepower motor for the beater brush, (3) a turbulator or beater brush, and (4) a heavy duty cord long enough to provide coverage of an area without excessive transferring of the plug.

Pile Brush. A machine which has two relatively stiff nylon brushes rotating toward each other serves two purposes: This type machine can be used for the dry powder method of maintaining carpet (which is discussed later). Such a machine also serves to brush up the face of the carpet where heavy traffic tends to mat down the pile.

Lightweight Vacuum. A lightweight vacuum (of the tank or back-pak variety) is most useful for sweeping under fixed furniture. A lightweight vacuum is also useful for cleaning

in corners and along baseboards.

The following supplies are needed by the custodian in order to do an effective job of caring for carpet.

Dry Powder Cleaner. This material (which looks like fine sawdust) is the backbone of the supplies needed to take care of carpet. It is also used in maintaining larger areas of carpet, as well as serving as a valuable spotting material. This compound is chemically treated and must be stored in an airtight container to prevent evaporation of the chemical components.

Spotting Kit. The spotting kit should consist of a supply of dry powder cleaner and a small G. I. type brush. For stains which have an oily base, a petroleum solvent cleaning agent is needed. For water-soluble stains, which the dry powder will not absorb, a sudsing type detergent cleaner is effective. These solvents are available from most janitorial supply houses.

Clean Cloths. Only absorbent type cloths should be used in order to absorb as much of the liquid stain as possible.

To maintain both the life and appearance of carpeting, efficient vacuuming at established frequencies is an absolute must for any effective maintenance program.

The question of how often to vacuum carpeting depends to a great extent on the general layout of the building, the type of carpet, its color, traffic load, and type of outside soil commonly brought into the building. However, it is possible to classify the different areas of a building and use these classifications as a general rule for establishing the vacuuming frequencies that will assure satisfactory results for the care of the carpet.

Heavy Traffic Areas. These are the areas which receive the heaviest dirt loads and consequently should be vacuumed daily for maximum protection. These areas include entranceways, lobbies, regions around steps, first floor corridors and rooms, cafeterias, and other highly frequented areas. Not only should these areas be vacuumed daily, but in some instances (such as during periods of bad weather) a second or even third daily vacuuming is often necessary.

Medium Traffic Areas. Medium traffic areas (because of their location) are normally subject to lighter dirt loads. By the time people reach these areas, most of the dirt brought in on shoes has been deposited in the heavy traffic areas. These medium traffic areas are generally on the upper floors of a building, or in rooms which are far removed from entrance-ways. Depending again on the type and volume of traffic, color of the carpeting and nature of the native soil, normally three vacuumings a week are usually sufficient to keep these areas clean and protected against wear.

Light Traffic Areas. Light traffic areas are the ones which have little or no spillage, and are usually so far removed from entrances that very little dirt is deposited there. These areas should be vacuumed as needed, usually not more than once or twice a week.

As the custodian vacuums, there are some important things to remember: A steady movement of the vacuum is better than quick jerky movements, since the vacuum must have time to work. The beater brush must have time to separate the pile, and the suction must have time to get the

dirt out. With the proper type of vacuum cleaner only one smooth steady pass is usually required to do a thorough job of cleaning. Occasionally, the custodian should re-arrange the placement of the furniture in order to change the walkway patterns and prevent one area of the carpet from receiving excessive wear.

SPOTTING

Before discussing spotting methods, it is necessary to become familiar with several types of stains which will most likely be encountered in a school building. These stains are generally placed into four categories:

Dry Stains. This type of stain is defined as loose stains. These are stains which do not adhere stubbornly to carpet fibers and normally can be removed by merely vacuuming. Stains in this category include sand, grit, cigarette butts, cigar ashes, and other types of non-oily and non-sticky stains.

Water Soluble Stains. These stains include sweets, starches, mud, and non-greasy food stuffs. Water soluble stains adhere to carpet fibers and do not normally respond

to just vacuuming. These stains can be removed with water soluble based chemicals, such as the foaming type of detergent cleaners.

Petroleum Soluble Stains. These stains include grease, salad oils, tars, asphalt, shoe polishes and waxes. These may originate from spillage, an excess of oil laden dust in the air, or may be tracked in from the outdoors. These types of stains adhere stubbornly to the carpet fibers and can be removed with petroleum solvent chemicals.

Other Stains. These stains usually result from spillage or similar accidents. Such stains include a wide variety of substances such as alcohol, coffee, tea, soft drinks, blood, urine, fruits and juices, ink, paint, and a variety of other liquids. Depending on the nature of the stain, the stain remover will vary.

The first thing to do when a stain is discovered is to remove (immediately) the excess staining material. If it is a solid material then a putty knife may have to be used to scrape up the loose staining material. Always work toward the center of the stain to avoid spreading the staining material.

If the stain is a liquid, an absorbent cloth or paper towel should first be used to blot up the excess liquid.

For non-oily liquids and dry stains, the dry powder cleaner method is an effective spot remover. In using the dry powder, first absorb the excess stain, then rub a hand full of powder into the stain with a small stiff bristled brush. Allow the powder to dry at least 30 minutes (longer, if possible) and then vacuum.

For stains which do not respond to the above treatment and which are non-oily, it may be necessary to use a foaming detergent type spot remover. Use the cleaner according to the directions of the manufacturer. Most of these cleaners are diluted with water. A sponge can be used to work the solution into suds. The suds are then applied to the spot with the sponge and rubbed toward the middle to keep from spreading the spillage. It is important to use only the suds and not the liquid, as excess moisture can damage the carpet. After the suds have evaporated, the spot should then be blotted to absorb any excess moisture.

If the stain is of the oily type, a petroleum solvent cleaning agent is needed. First, wipe up as much of the excess

spillage as possible by using a clean absorbent cloth (wipe from the outer edges of the spot toward the center). Then apply a small amount of the petroleum solvent cleaner to the spot and wipe with a clean cloth, again working from the outer edge to the center of the stain. Repeat the process until clean. If the spot is difficult to remove, and it is necessary to apply an excess amount of the solvent, it is recommended that a pad of absorbent cloth be applied over the spot, weighted down and left overnight to dry. This will help the spot to dry quicker and lessen the danger of the solvent attacking the latex compound on the backing of the carpet.

CLEANING

Even with a properly carried out maintenance program it will be necessary to thoroughly clean the carpet on occasion. The dry powder method of cleaning is highly recommended. This method is considered safe because it eliminates the use of moisture which may damage the carpet. Second, dry cleaning does not require skilled operators, and

it has the advantage of allowing immediate use of the cleaned area.

To use the dry powder method of cleaning, the first step is to remove all loose furniture from the room. Sprinkle the powder over an area of about 10' by 10'. The powder should be used in the amount stated by the manufacturer. The next step is to apply the motor driven pile brush on the powdered area. Push the pile brush machine first in one direction, and then reverse and brush at a 90 degree angle across the first direction. Allow the powder to remain on the carpet until the chemicals have evaporated or until the odor is no longer present. Then vacuum the area thoroughly (any stray powder left on the carpet can be removed in subsequent vacuumings). A lightweight vacuum should be used to remove the powder close to the baseboard, in doorways, under radiators, and in other difficult places.

When the dry powder method of cleaning is no longer effective in maintaining the appearance level of the carpet, it may then be necessary to clean the carpet with some other method which employs liquid in the cleaning process. It is

recommended that an outside contract be given to a company which employs and specializes in the steam cleaning method. This method is recommended because it does an efficient cleaning job and leaves very little moisture in the carpet.

SUGGESTED TIME SCHEDULE

Cleaning Task	Daily	Every Other Day	Twice Weekly	As Needed
Spotting	x			
Vacuuming Heavy Traffic Areas	x			
Vacuuming Medium Traffic Areas		x		
Light Traffic Areas			x	
Cleaning (Dry method)				x(a)*
Cleaning (Wet method)				x(b)
Pile Brushing Walkways				x(c)

*(a) Approximately every 30 days for heavy traffic areas, 45-60 days for other walkways, and every 90-180 days for other areas.

*(b) Once a year maximum.

*(c) Heavy traffic walkways every 30 days. Medium traffic walkways every 45 days.

CHAPTER VI

THE THERMAL ENVIRONMENT

Recent developments in school planning have revolutionized temperature management in school plants. Heating, ventilating, and air conditioning systems have literally changed the classroom environment. A successful custodian can no longer be considered merely the clean-up man. He must be a well-trained technician in many fields. The area of operation and maintenance of the heating and cooling facilities is among the most expensive part of school plant maintenance cost. No single problem is more controversial than proper room temperature. Since optimum temperature varies with different kinds of activities, it is imperative that the successful custodian ascertain as quickly as possible the proper temperature for each teaching area. A desirable temperature level for each kind of teaching space is included herein as a suggested guide.

The custodian should know the optimum temperature range for his building. There are conditions, however, over which he has very little control unless the school administrator is

thoroughly aware of the principles involving heating and cooling problems. The most frequent thermal problem in a school building is overheating; and the person who contacts the custodian most often on heating matters is usually the classroom teacher. It is an established medical fact that the rate of body heat decreases as age increases, therefore, the older teacher is inclined to request for more heat than is actually healthful for her students.

DESIRED TEMPERATURES FOR VARIOUS AREAS

Area	Temperature	Overnight Temperature
Classrooms	70-75°	55°
Offices	70-75°	55°
Assembly Hall (when used)	68-70°	55°
Industrial Arts Shop	65-68°	55°
Corridors	65-68°	55°
Gymnasiums	60-65°	55°
Toilets	60-65°	55°
Bathroom and shower room	75-80°	55°
Swimming pools	75-80°	55°
Open Air Rooms	60-64°	55°
Kindergarten	72-76°	55°

AIR CONDITIONING

Air conditioning systems for schools are used to provide a comfortable and healthful learning environment. Most of these air conditioning units are provided with individual room controls. Various units such as roof vents, grill covers, motors, fans, air filters, and controls require special attention of the custodian, and each component requires periodic inspection by specialists.

Care of Filters. Dirty filters contribute to inefficient and faulty performance of air conditioning systems. Periodic inspection is necessary to determine when filters should be replaced or advanced.

Lubrication. The manufacturer's instructions must be followed since requirements vary from unit to unit.

Seasonal Maintenance. General inspection, maintenance, cleaning, and repairing should be done as required. Periodic inspection must be made to assure proper functioning of belts, blowers, fans, linkages, and dampers.

VENTILATION

A principle of proper ventilation is to produce adequate air movement within the classroom, while not creating undesirable air-drafts. The ventilation system should also displace foul air in the classroom and bring in a sufficient amount of fresh air from the outside to satisfy the needs of the occupants.

Systems. There are several types of ventilation systems which can be classified under the heading of gravity systems. The gravity system depends on the differences in the weight of hot and cold air for the air-movement. This system is economical to install and has good results under certain conditions. A modified system is one in which the gravity system principle is used, but which is accelerated by the use of radiators in the ventilating stacks, or by the use of small fans at certain intervals.

The mechanical system is one in which the air movement is controlled by fans which remove the air from the building. The mechanical system appears to be very efficient if properly installed and maintained.

Ducts. Another method of ventilation is to provide ventilator ducts for each room from the building roof. Many of these ducts are installed in the cloakroom closet, while some are installed in the lower part of the wall in the classrooms. When ducts are used each room should be provided with a separate duct. The ducts should also be fire resistive to restrain the spread of fire from one part of the building to another.

Corridor Ventilation. Under this method, the stale air is taken out of the classroom through the door or through louvers and grills in the lower part of the door and deposited in the corridors. The air then circulates through the corridors and is removed from the building via the roof. This type of system is relatively inexpensive and has proven satisfactory for many buildings. Ventilation ducts should be equipped with dampers that can be opened or closed, however, they should not be kept closed during the school day. The closing of dampers during the day can prevent obtaining the desired amount of air required for proper circulation.

Unit Ventilator. Another type of ventilation system is

the unit ventilator. This type unit is normally installed in the classroom on the outside wall to provide both necessary heat, and proper ventilation. The entire operation of the unit ventilator is automatically controlled by a thermostat located on the inside wall of the classroom. This type of ventilation is essential in many areas since gravity ventilation is seldom satisfactory for toilets and locker rooms.

HEATING

A proper heating system is vital to a school. Detailed instructions on the appropriate care and operation of the heating equipment are equally essential. In maintaining high operating efficiency, the custodian must know how to intelligently operate and maintain the heating equipment and accessories. Neglect of the heating system will result in unnecessary repairs, increased fuel bills, and decreased heating efficiency.

Boilers are usually classified as low pressure or high pressure ones. Most school boilers are of the low pressure type. But, improper operation, neglect of valves and controls,

and general dirty conditions can make the low pressure boiler a potentially high pressure problem. High pressure boiler usage is decreasing in schools. Custodians should not attempt to use them unless they are thoroughly qualified.

Gauges should be checked out and tested while under pressure during the working season. Safety devices should be inspected during the down season and replaced as needed. Steam pressure and water level should be checked continuously while in operation. All electrical controls should be checked periodically by a competent electrician and kept clean at all times. In case of a low water problem in the boiler, the fuel and air supply should be stopped and the boiler allowed to cool. A thorough inspection should be made for cracks and other damage before reusing.

General Maintenance. The boiler and boiler room should be continually kept clean. Dirty boilers demand more fuel. Boiler flues should be cleaned thoroughly with wire brush as often as needed. Boiler water can be kept clean by using the blow down method when necessary. The boiler should be periodically inspected during the down season and repaired as needed. Sludge should be removed from oil tanks annually.